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THE DECORATOR AND FURNISHER.

AMERICAN STAINED GLASS.

BY R. RIORDAN.



It was not until quite recently that much could be said (or anything in the way of praise) about American stained glass. Yet, to-day, much of our work can stand comparison with good contemporary European work, and not a little is far superior to the best of it in very important respects. Less than twenty years ago there were but eighteen makers of stained glass in the United States, and the work which they turned out was of the very worst description. Properly speaking it was not *stained* glass at all. The enamel method was that which was most used. Coated glass—clear glass with a thin layer of color on one side—was employed to a certain extent. And when something extra-

ordinarily fine was demanded, a few bits of imported "pot-metal," colored *en masse*, were used to bring the work up to the highest standard that our people had any idea of. Specimens of this sort of work may be seen in plenty everywhere. The colors are dull, thin and raw, and, especially when the imported glass has been used with American, startlingly inharmonious. The design is almost invariably stolen or "cooked up." The workmanship is feeble and uncertain; the heavy lines of the leading being sometimes properly used when a good original was followed, sometimes rendered an eye-sore by being led across the design like the sashes of an ordinary window, sometimes run at random for no other purpose than to give the work an antique appearance. In all this, the makers were but following the European practices of a generation ago, and could not claim any originality in evil-doing. Our people had simply reached the lowest point possible in the art at the moment when in England and France its true principles were being revived.

Any one who has passed an hour in one of the great mediæval churches of Europe, lit by windows that seem made of jewels, or even seen in a loan exhibition some fragments of ancient glass, knows at least what rich effects of color the old masters of the art produced with rude means and imperfect material, while modern workmen, with perfectly clear and even glass, tints at command, and a comparatively free *technique*, could not until lately attain to similar results. This must seem all the more paradoxical when it is added that our recent progress is due to the fact that we have in a great measure renounced these seeming advantages. It is explained, however, by an examination of the mediæval glass and the methods employed by its makers.

Windows were originally glazed with colored rather than colorless glass because it was easier to obtain the former. The Romans certainly knew how to make perfectly clear glass,—so clear as to be mistaken for crystal; but the earliest glass objects, Egyptian beads and Phœnician bottles and vases, such as those of the Cesnola collection, were always tinted, purposely or by impurities which the makers did not know how to remove. In the fourth and fifth centuries, when the art of glass making was reintroduced into Western Europe by Byzantine workmen,

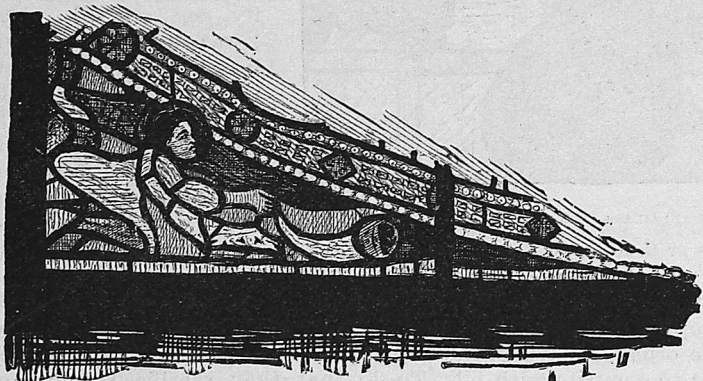


FIG. 1.—ADORING ANGEL FROM THE "WINDOW OF THE VIRGIN." VENDOME, TWELFTH CENTURY.

it had fallen back into its primitive condition in this respect. Even in the twelfth century the clearest glass was a rather dark horn-green or dingy nacreous gray. Of other colors they had a splendid red, obtained by mixing little scales (*paillettes*) of

copper in the melted glass, and blues much finer than the modern, got from pellets of blue Roman glass sold by the Byzantines under the name of "sapphires." They had several good greens, purple and mordoré. Their yellows only were inferior, being dull and smoky. Of all these colors there were endless tints, gained perhaps by accident, but used with the finest judgment. Their coloring-matters were incorporated with the glass in the melting-pot, and thoroughly fused. Their colors were therefore deeper than those of modern coated-glass, and both richer and brighter than those of enamelled glass, which, besides being only on the surface, are seldom perfectly fused, and consequently tend towards dullness and opacity. Their pot-metal—the glass colored in its substance—was heavy, of varying thickness and uneven surface; each piece had tone, changing in depth of shade from dark to light, and in tint from warmer to colder, according to its inequalities of thickness. The red alone was coated on uncoated glass; but they knew how to dispose the laminae of copper which colored it so as to let the light pass between, and thus were enabled to make the red coating of about half the thickness of the sheet. Modern reds, on the contrary, whether of copper, gold or iron, are so dense that they can only be used in layers thin as paper. So much for the "limited palette"



FIG. 3.—PORTRAIT OF HENRI DE MEZ. CHARTRES, THIRTEENTH CENTURY.

of which some writers speak, and which held two of the three primary colors of a strength and brilliancy that we cannot yet equal after years of experimenting, on which every color was a tone in itself, and which included almost as many tints as ours, although obtained by hazard. They had no entirely colorless glass to look like a hole in the window, and none that was without gradation.

As to the texture of the glass, it was full of what a modern glass-blower would be apt to regard as imperfections. In making a sheet of glass the workman takes a quantity of the "metal" from the melting pot on the end of his iron blow-pipe, blows it into a somewhat globular or bottle shaped vessel, and, if following the modern method of making crown glass, shapes that into a cylinder, which, being detached from the blow-pipe and slit longitudinally, is opened into a flat, square sheet in the "flattening oven." To obtain the cylinder form, the hollow glowing sphere has to be removed from the blow-pipe by applying a solid iron rod, called a "ponty," tipped with melted glass, to its opposite extremity. The opening left where the end of the blow-pipe was attached is then enlarged into a circle of the full



FIG. 2.—FROM A WINDOW OF THE TWELFTH OR THIRTEENTH CENTURY. SAINT-REMI, REIMS.

diameter of the vessel. A straight strip of glass is placed across this opening, adhering firmly to its edges, and the blow-pipe is again fastened to that. The other end of the vessel is then removed from the "ponty," and liquified by heat until an opening is made in it, which is enlarged as before. The twelfth and thirteenth century workmen had a similar but more imperfect way of producing thin sheets of glass. The blown globe, always attached to the blow-pipe, was opened at the opposite side by being heated to liquefaction, and then, the tube being rapidly

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twirled around by the fingers, the edges of the opening diverged by centrifugal force until a disc was produced, striated concentrically, and thicker at the center and circumference than elsewhere. In the flattening oven, and when firing after painting, their methods were as primitive and careless. There resulted a rich variety of "imperfections," which gave interest as well as tone to the glass, and lessened its transparency without at all diminishing its translucency and lustre.

Lastly, as to *technique*. The ancient windows were composed of pieces of glass, colored all through, with the exception

Viollet-le-Duc, shows the manner of shading with enamel, and of taking out lights, and Fig. 3 shows the use of the leading as outline, and also, to give the effect of narrow lines of shade. Figs. 1 and 3 are from Gailhabaud *L'Architecture et les Arts qui en dependent*.

By the pure enamel method it is possible to do without much leading, but impossible to avoid it altogether. Very large sheets of glass painted with enamel colors cannot be burnt so as to vitrify the enamel without running great risks of spoiling the color. Still, much of the leading being got rid of, a softer

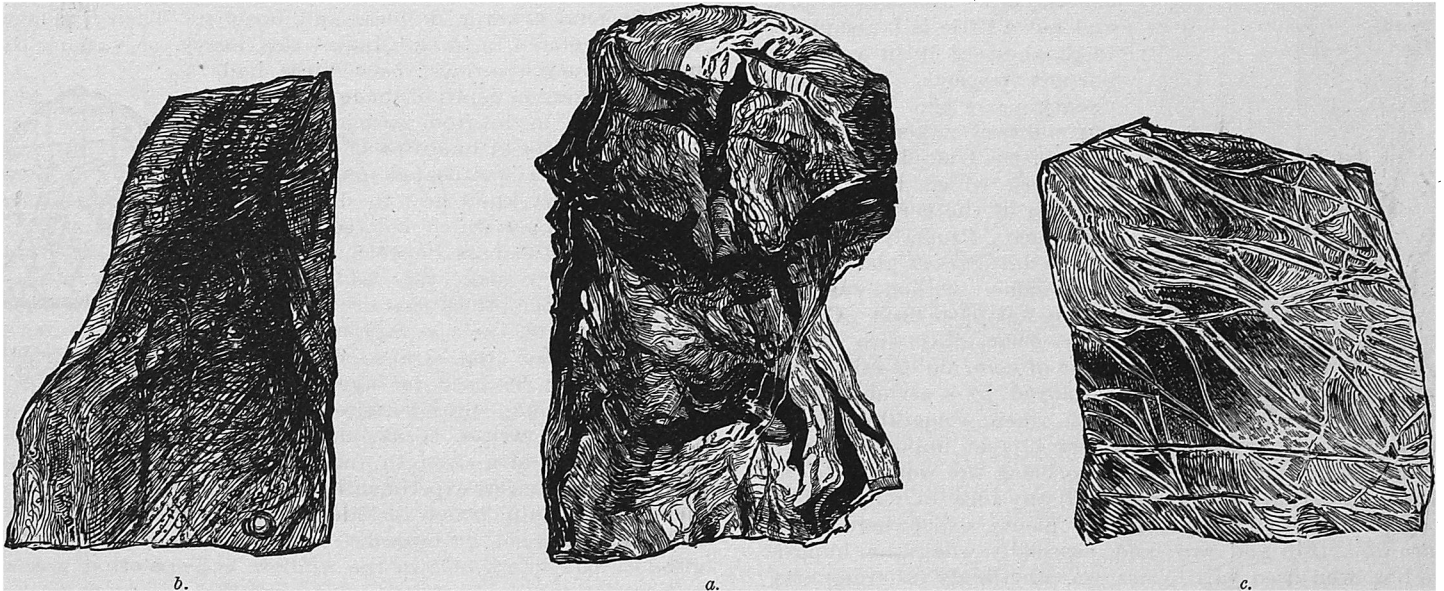


FIG. 4.—SPECIMENS OF AMERICAN "ANTIQUE" GLASS.—DRAWN BY R. RIORDAN.

of the red coated glass, cut into the required forms, and leaded together. When shading was required to express folds of drapery, small ornaments, and the like, a thick brown enamel was applied in firm hatchings and burned in. Later, at the best period of the antique style, broad shadows of a thinner preparation of the enamel were added, and lights were taken out before the second firing by removing some of this "smear" with a style or the handle of the brush. In very perfect work, to be looked at from no great distance, a second application of the "smear" was made in parts, and the dark hatchings were reinforced with absolutely opaque black.

The background, if too brilliant, was toned down by a very fine cross-hatching of dark lines, or covered with conventional ornamentation in the same manner. All this work was of extreme boldness and vigor, the object being to gain strongly marked form and to subdue the glare of light without interfering with the purity of the color. Broad lights were left, particularly near the edges of a color-mass, and the shadows were full of minor lights in the interstices of the dark hatchings and where the broader shading had been removed with the style. The effect was highly decorative and very little pictorial. The figures or other subjects, strongly outlined in every part by the leads which held them together, were easily distinguishable from a great distance;

the dark shading was softened and overspread with subdued color by the radiation of light from the unshaded parts; and compound tints were gained, in the same way, by the juxtaposition of two primitive colors. No attempt was made at aerial perspective or pictorial illusion. The limitations of the art were frankly observed. It was not sought with transmitted light to produce the effects proper to reflected light, not to disguise the presence of the indispensable leading. Fig. 1 will give some idea, such as can be given without color, of these early windows, in which strong feeling managed to express itself, in spite of poverty of acquirements and of means. Fig. 2, which is from

and more delicate style of drawing and shading may be employed and the work becomes, so far, like a painting in oils rather than a mosaic. Unhappily, the mind resents this perfection as if it were a trick. The window so converted into a painting is no longer a window. It does not merely subdue the light in letting it pass. It excludes the light without, and reflects the light within. It does not play its part in the general decoration, but is an independent work of art, badly placed. It has no appearance of structure or solidity. One wants to thrust his fist through it to make sure that something real is there. It is a

nightmare,—an anomaly. This unsatisfactory feeling is increased by the dullness and thinness of the colors; and, at a little distance, all the fine drawing and detail is lost,—eaten away by such light as struggles through. The light which the old glass-stainers knew how to make use of in giving softness and finish and harmony to their work, is the enemy of their more pretentious successors, and destroys what they have taken so much pains to create.

"The discovery of enamel colors," says Winston, the English authority on stained glass, "was made at an unlucky moment." There is no doubt that, if the masters of the twelfth and thirteenth centuries had known of other enamels than the brown, they would have used them as freely and legitimately as they used that.

But in the sixteenth century the art had already abandoned its proper decorative and structural functions, and the discovery of the other enamels only encouraged the glass-painters in attempting to compete with oil. To do that they sacrificed color, solidity, and intelligibility, and then, as might have been expected, failed of their aim. There is, I believe, some use in art for every imaginable process, and it is quite possible that enamel on unstained glass may have peculiar advantages, as well as defects. It is its abuse in the production of windows, which look better by reflected than transmitted light, that is to be unreservedly condemned. At the same time I have never seen the work in

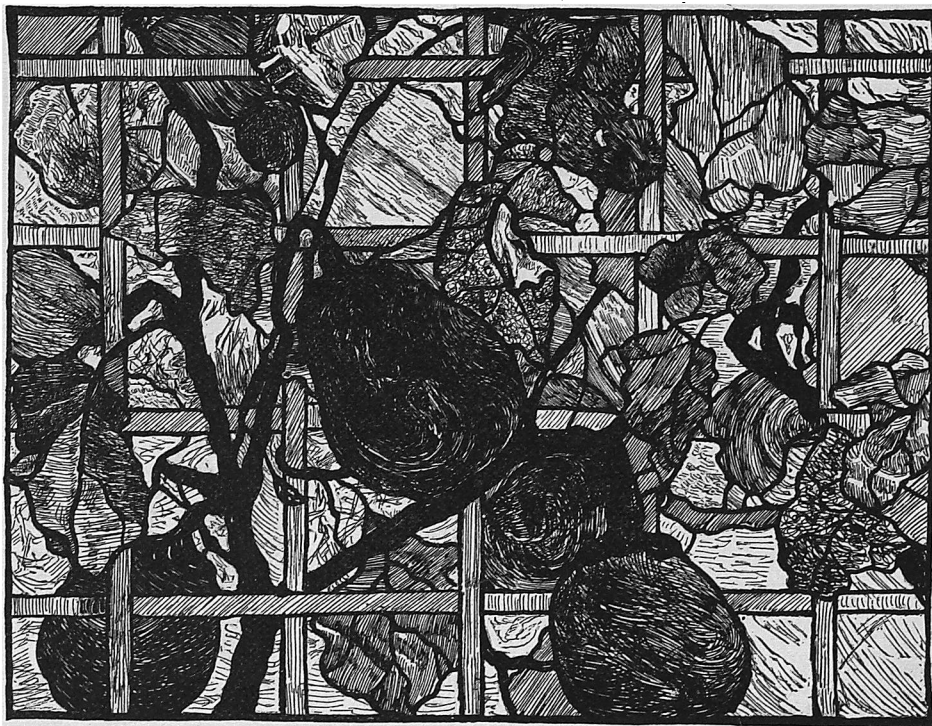


FIG. 5.—WINDOW SCREEN IN PURE MOSAIC GLASS. EGG-PLANT.

BY LOUIS C. TIFFANY.—DRAWN BY R. RIORDAN.

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pure enamel which, for a window, I would not prefer to have done in mosaic, or enamel on mosaic. The cheapness of the enamel method, both as regards material and labor, was perhaps as powerful an inducement to its abuse as any other; for the decline which had already taken place in stained glass was, in part, due to the great cost of the ancient method. The twelfth century windows were narrow and not numerous; but as the architects made their wall piers lighter and farther apart, the great space between had to be filled with glass, and the costliness of colored pot-metal led to the use of more and more white glass or grisaille windows. The invention of the yellow stain of silver led to the almost complete disuse of the pot-metal colors. The growth of the Renaissance feeling helped the downward progress of the art by introducing designs unsuited to the

material, and, finally, the growth in purity and clearness of the unstained glass deprived the grisaille windows of their last glory of pearly or greenish lustre, and left the whole field clear for the enamellers. The new form of glass-painting did not flourish long, though great artists tried their hands at it. It fell into disuse and disesteem as oil-painting multiplied its triumphs; and in 1768, according to Le Vieil, there was but one glass-painter in Paris, and he could not maintain himself by his art, but had to gain a living by carrying on a trade in glass.

To whom belongs most credit for the revival in Europe of the antique style it would be hard to say. The Germans were the first in the field, but the pot-metal that they make is so thin that it must be backed up with thick plate-glass to prevent it from being blown in by the wind, and so glaring that they have been in the habit of coating it with a layer of enamel over

all, "of the thickness and color of pea-soup." Winston was perhaps unduly elated over the result of his analyses of ancient glass when he boasted that he had "beaten the French glass-stainers so hollow that it is quite laughable." Viollet-le-Duc is not likely to have been far mistaken in maintaining that some of the modern French restorations are not to be distinguished from the ancient work. It is certain that the opinion became general in England, France and Germany about the same time, that, if the ancient windows were to be equalled, a return must be made to the ancient methods. That opinion was long in making its way across the Atlantic. Our manufacturers and their customers were equally opposed to it; the former, because the "antique" glass required labor, taste, and skill; the latter, because it was costly, old-fashioned, and lacked the false finish which distinguished the better specimens of enamelled glass. A people like ours, new to art, and accustomed to admire in all their surroundings the regularity and evenness of machine-work, could hardly be expected to appreciate at once the mosaic style. It required some courage and a great deal of constancy to introduce it. But when the universal revival of interest in artistic matters began to touch us, it was inevitable that its effects should be seen most decidedly in stained glass. The very narrowness of the limitations within which it is properly bound guaranteed rapid progress as soon as the true path was entered. And, on the other hand, the strong temptation to experiment with the material could hardly prove to be thrown away on American workmen. No other material used in any of the fine arts so well repays experiment. The infinite variety of effects afforded by its natural accidents of striæ, bubbles, unequal blending or distribution of the coloring matter, etc., leaves always room to hope for something not yet attained. As a consequence, notwithstanding the immense progress which all the forms of decorative art have made with us in the last few years, it is safe to say that none of them have improved as much as our work in stained glass.

Page, McDonald, and McPherson, of Boston, were among the first to make good pot metal glass in America. Some of Page's glass was shown to Mr. Russell Sturgis in 1870, and he found it difficult to believe that it was made here. Baker, of New York, began to make "antique" some years later. His work was and is distinguished by good feeling for color and a determination to use artistic material only.

Cottier & Co., "of Fifth Avenue and Pall Mall," about the same time introduced here what is known as the English Do-

mestic Style of Stained Glass. This is in some respects a new departure, but we cannot say that it is one which ought to be widely followed. The glass used is English pot-metal, clearer and poorer in effect than the American. The coloring is low, thin, but harmonious. The drawing is reasonably good. The distant effect is better than that of many American windows, while still far from admirable. The prevalent English "fads"—the affectations and the unintelligible symbolism of modern British painting—have a weak echo in the figure designs of this school, and the purely decorative part of the work is as far removed from a healthy style of art. The leaded lines are little insisted on. The beauties of the material are never fully developed. The surface painting and staining are not calculated to help it, but are used for their own sake; and weakly conventionalized forms of foliage, sunflower, etc., are drawn upon the glass as if it were paper. The cartoon is generally as interesting as the window.

On the contrary, good American pot-metal, such as is now made, is often as heavy and as rich in color, tone, and texture as any of the twelfth-century glass. In Fig. 4 (drawn from specimens furnished by Messrs. Louis C. Tiffany & Co., Associated Artists) we have attempted to convey some notion of its varied surface and markings. Fig. 4 *a* is a clear, slightly greenish glass, streamed with ruby, black and purple. Fig. 4 *b* is full of bubbles and long tangled fibres of iron-red. Fig. 4 *c* is of a changeable blue-green, and impressed on both sides with an irregular linear pattern. There are almost countless other varieties as interesting and as fine in color. The "opal" glass which has been introduced by Mr. La Farge and Mr. Tiffany is one of these, which is itself capable of an infinity of uses, and of entering into combinations, more or less intimate, with every other variety. A full account of it will be given in a second article.

The stained glass window screen represented in Fig. 5 is a good example of the mode in which Mr. Tiffany handles his splendid material. The thick stalks of the vine, the outlines of the lattice work which supports it, and the veinings of the leaves, are all designed by the leading. The modelling of the leaves and fruit is given by the inequalities of the glass itself, and the play and gradation of color in its substance. When the sunlight streams in through such a window the effect is as if the real object, rendered transparent in all its tissues by some unwonted intensity of the ray, filled the space. No enamel painting, no work in any other medium, could be anything like so "realistic;" yet it is plainly glass, and one is fully as much impressed with its decorative and structural as with its picturesque value. It is like one of those little landscapes by Dupré, in which the loaded sky, while manifestly and unmistakably paint, is yet more distant, aerial, and full of motion than if the painter had taken the greatest pains to hide his methods and his means.

The finest kinds of glass, including plate for windows as well as that used for tableware, are comparatively soft and easily scratched. French mirrors and other highly-polished glass surfaces are often dimmed and scratched by the use of harsh cloths and newspapers in combination with polishing and cleaning powders and soaps especially recommended for glass cleaning. Both potash and soda attack glass, and are capable of removing or greatly injuring the polish. Even common soap and water dim the surface perceptibly after frequent applications. For windows, mirrors, glassware, and polished glass generally, it is best not to use soap in cleaning, and to employ only the softest and finest of cloths. Polishing powder, polishing soaps—and, in fact, anything harder than prepared chalk—should not be tolerated. For fine glassware, mirrors, &c., alcohol and water is probably the most convenient and safest liquid that can be used. No polishing powder to be found in the market is fine enough to improve or preserve the polish of the better kinds of glass. In some cases a little acetic acid or lemon juice may be added with advantage. Upon windows whiting or prepared chalk is frequently recommended, but the polish obtained in this way is inferior to that given in manufacture.

